

**WY-185
Maintenance
Manual**

4239

WYSE
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WY-185 Maintenance Manual

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Wyse Technology
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FCC NOTICE

☐ **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripherals or host devices. Failure to do so may violate FCC rules.

☒ **Caution:** Changes or modifications not covered in this manual must be approved in writing by the manufacturer's Regulatory Engineering department. Changes or modifications made without approval may void the user's authority to operate this equipment.

CANADIAN DOC NOTICE

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

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1

General Information

INTRODUCTION

This manual describes a high-resolution, non-glare with overscan, flicker-free display terminal that provides complete VT320 emulation plus numerous enhancements. This terminal incorporates the following standard features:

- 15x12 character resolution mode
- 10x20 character resolution mode
- Tilt/swivel base
- 14-inch, nonglare, dark-face, P22 phosphor, etched glass screen
- Borderless, full-screen video
- 85 Hz refresh and overscanned video for flicker-free display
- Built-in RS-232 male DB25 connector (Port A) and Wyse modular 423 connector (Port B) for easy installation

The terminal is available in two models:

- A North American model with English and French Canadian keyboard language support
- An international model that supports 15 keyboard languages and user-selectable French or German setup screens and status line messages

ENVIRONMENTAL CONSIDERATIONS

Position the terminal on a clean horizontal surface that is free from vibration and out of direct sunlight. Allow three inches of clearance on all sides of the terminal for air circulation and movement of the tilt/swivel mechanism.

INSTALLATION

To install the terminal, follow these steps:

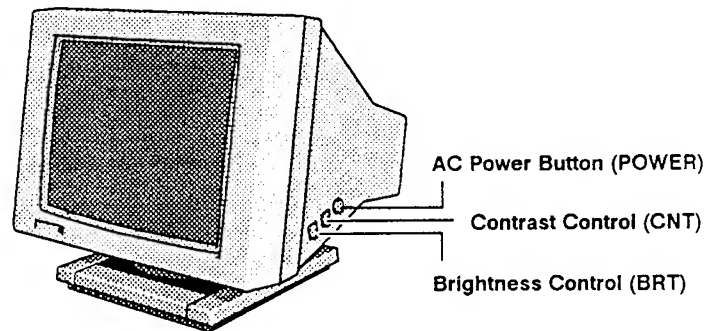
- 1 Connect the attached power cord to an AC power receptacle.
- 2 Connect the communications cable to either the DB-25 or Wyse modular connector. Secure the communications cable to the connector using the two captive screws that are attached to the cable plug. **Do not use excessive force when tightening these screws.**

Caution If you are connecting the terminal to a WY-995 Multiport Adapter from Wyse Technology, use the Port A 25-pin connector.

OPERATOR CONTROLS

The terminal's operator controls are located on the side of the unit. Operator controls consist of an AC power button (POWER), a contrast control (CNT), and a brightness control (BRT) (see Figure 1-1).

Figure 1-1 Operator Controls



CLEANING

Whenever it becomes soiled, turn off the terminal and clean it with a commercial grade of plastic and/or glass cleaner. Never pour or spray cleaners directly on any part of the terminal. Moisten a cloth with the cleaner and use the cloth to wipe the surface.

SPECIFICATIONS

Table 1-1 lists the specifications of the terminal.

Table 1-1 Terminal Specifications

Description	Specification
Power Requirements	
Line Voltage	110/220 VAC
Line Frequency	50/60 Hz
Power Consumption	45 Watts
Fuse	2 A, 250 V
Input Voltage Range	
110 VAC	90-132 Volts
220 VAC	180-264 Volts
Input Frequency Range	
	47-63 Hz
Environmental Requirements	
Operating Temperature	10 to 40 degrees C
Storage Temperature	-40 to 60 degrees C
Operating Altitude	10,000 feet (3049 meters)
Nonoperating Altitude	40,000 feet (12195 meters)
Humidity	20% to 80% noncondensing

Table 1-1 Terminal Specifications,
Continued

Description			Specification			
Scan Frequency						
Horizontal			31.380 KHz			
Vertical			60 and 85 Hz			
Picture Tube						
Size			14 inches			
Gun			In-Line			
Deflection Angle			90 degrees			
Phosphor (white)			H188			
Phosphor (green)			H31			
Phosphor (amber)			H194			
Display Size						
Horizontal Image			237 mm ± 5.0 mm			
Vertical Image			172 mm ± 5.0 mm			
Resolution						
Mode	H	V	Vert Freq	Horz Freq	Rows	Col
1	800	500	60.00	31.380	25	80
2	800	300	85.04	31.380	25	80
3	1200	500	60.00	31.380	25	80
4	1200	300	85.04	31.380	25	80
5	1188	500	60.00	31.380	25	132
6	1188	300	85.04	31.380	25	132
Character Cell			60 Hz		85 Hz	
80 column			10x20		15x12	
132 column			9x20		9x12	
Character Size (Text Mode)			60 Hz		85 Hz	
80 column			9x16		12x9	
132 column			8x16		8x9	
Centering						
Horizontal			± 5.0 mm			
Vertical			± 5.0 mm			
Pincushion			± 2.50 mm			
Tilt			± 1.20 mm			
Brightness (maximum)						
White			45 fL (+7 -3)			
Green			70 fL (+7 -3)			
Amber			32 fL (+7 -3)			
Raster			1.0 fL ± 0.5 fL			
Linearity						
Horizontal			10%			
Vertical			10%			
Wave and Jitter			± 1 pixel			

Table 1-1 Terminal Specifications,
Continued

Description	Specification
Dimensions	
Height	318 mm
Width	322 mm
Depth	318 mm
Net Weight	7.5 Kg
Video Signal	
TTL	
Dot Frequency	49.4235 MHz
Synchronization Signal	
TTL Levels	0.8 V (low), 2.0 V (high)
Warmup Time for Adjustment	
	30 minutes
Regulatory Agency Approvals	
Safety	UL 478
	CSA C220
EMI	IEC 380 (220-volt unit only)
	FCC Rules and Regulations, Part 15, Subpart J, Class A
	VDE 0871 (VDE unit only)
	DHHS rules 21CFR Subchapter J.
	VDE version passes Scandinavian SSI specification for EMF.

2

Removal and Replacement Procedures

INTRODUCTION

This chapter provides removal and replacement procedures for major modules.


Tools

To perform these procedures, you'll need the following tools:


- No. 1 Phillips insulated screwdriver
- No. 2 Phillips insulated screwdriver
- Insulated flat-blade screwdriver
- Long-nose pliers
- Test leads


Safety

Before beginning any procedure, familiarize yourself with the following safety warnings and cautions:

 **Warning** When the cover of the terminal is removed, you are exposed to high-voltage electrical hazards. If you need to work with the cover removed,

- Turn the power off and unplug the power cord before removing the cover.
- Use insulated or nonconductive tools.
- Remove jewelry from your hands and wrists.
- Keep one hand behind you while working on the terminal.

 **Warning** Use extreme caution when working with or around the CRT. Even a slight fracture of the glass envelope can result in an implosion due to the vacuum inside the tube. This can result in the electron gun in the neck of the CRT penetrating the viewing surface. Always hold the CRT with the neck pointing toward you.

 **Caution** To help prevent damage to circuit components,

- Avoid wearing clothing made of synthetic fabrics.
- Handle circuit boards only by their edges.
- Wear a grounding strap that is connected to the terminal's chassis.



Warning If you wear a grounding strap, remove it before turning on the terminal.

PROCEDURES

Except for the tilt/swivel base, all assemblies are accessible only after the cover is removed.



Note To replace assemblies, perform removal procedures in the reverse order.

Cover

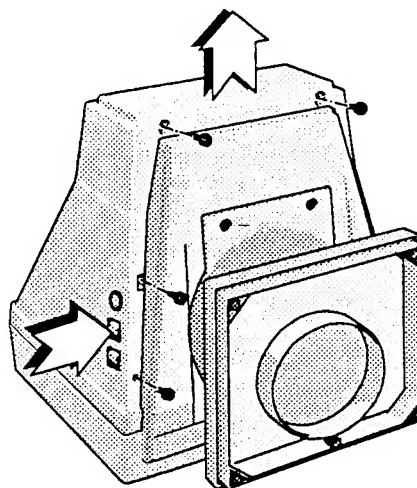
Perform the following steps to remove the cover (refer to Figure 2-1):

- 1 Rest the display face of the terminal on a padded nonscratch surface.
- 2 Remove the two screws that secure the operator control assembly. Push the operator control assembly back into the terminal as far as it will go.
- 3 Remove the two screws that secure the cover.
- 4 Slide the cover straight back and remove.



Note In addition to the screws, the cover is held on by two tabs located at the top. The cover can be removed more easily if the top of the cover is pushed on slightly.

Figure 2-1 Cover Removal



Fuse

The fuse is located inside the metal housing on the PCB behind the AC power plug.

The fuse is rated at 2.0 amperes, 250 volts.

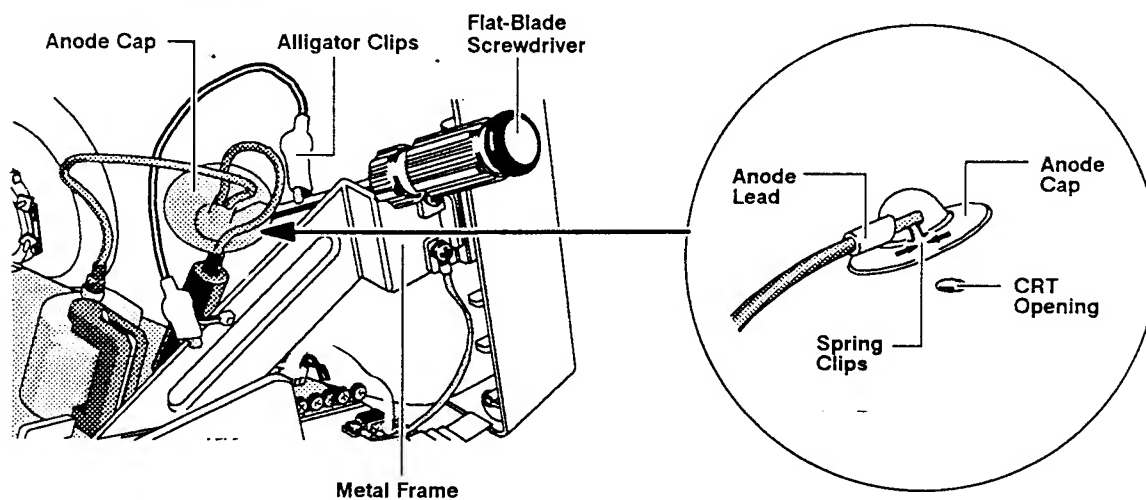
Discharging the Anode and Disconnecting the Anode Cap

Perform the following steps to discharge the anode and disconnect the anode cap (refer to Figure 2-2).

Warning You must always discharge the anode before removing the PCB or CRT, but be aware that the anode will build a residual charge even when the power is off. Avoid touching the anode when handling the CRT.

- 1 Turn off the terminal.
- 2 Unplug the power cable.
- 3 With test leads, ground the shaft of an insulated flat-blade screwdriver to the terminal's metal frame.
- 4 Slip the screwdriver blade between the anode cap and the CRT, and touch the blade to the spring clips under the cap.
- 5 Disconnect the anode lead from the CRT by squeezing the spring clips together with long-nose pliers.

Figure 2-2 Discharging the Anode



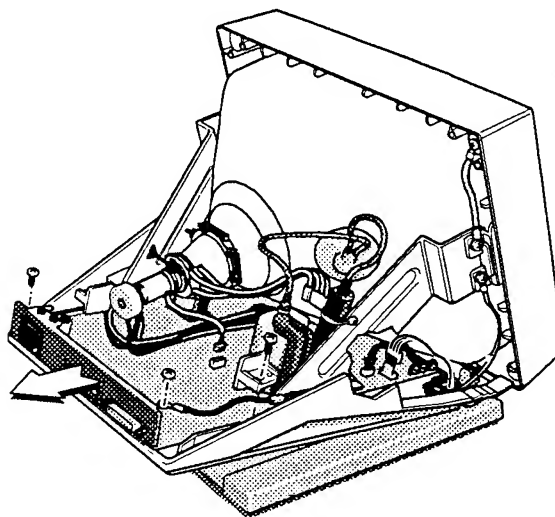
Printed Circuit Board

Perform the following steps to remove the PCB from the terminal (refer to Figure 2-3):

- 1 Remove the terminal's cover.
- 2 Discharge the CRT anode and unplug the anode cap. Cut the tie wrap holding the high voltage capacitor to the left bracket.
- 3 Remove the two screws holding the PCB to the terminal.
- 4 Unplug the following harnesses from the terminal PCB:
 - Contrast control harness (3-pin connector marked "W401")
 - Brightness control harness (3-pin connector marked "W202")

- Power switch harnesses (1-pin connector marked “S2A and S2B”)
 - LED harness (2-pin connector marked “P4”)
 - Yoke harness (4-pin connector marked “W201”)
 - Keyboard harness (4-pin connector marked “P5”)
- 5 Unplug the CRT harness from the CRT.
 - 6 Unscrew the screw holding the earth ground wire (green with a yellow stripe), to the right bracket. Remove the screw holding the black grounding wires to the right bracket.
 - 7 Remove the PCB hold-down clamps from both sides of the PCB.
 - 8 Carefully slide the PCB straight back and away from the terminal.

Figure 2-3 Terminal PCB Removal

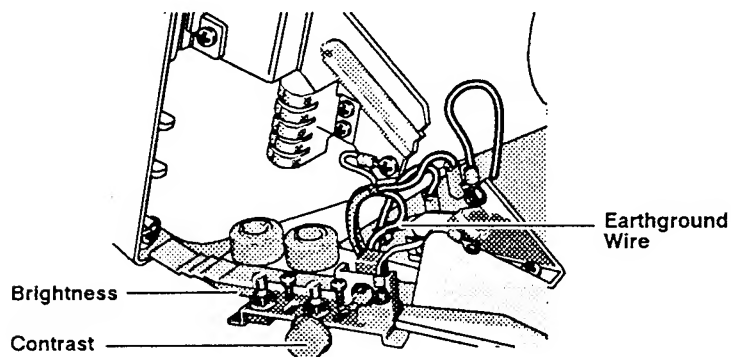


Operator Control Assembly

Perform the following steps to remove the operator control assembly (refer to Figure 2-4):

- 1 Unplug the following harnesses from the terminal PCB:
 - Contrast control harness (3-pin connector marked “W401”)
 - Brightness control harness (3-pin connector marked “W202”)
 - Power switch harnesses (1-pin connector marked “S2A and S2B”)
- 2 Remove the screw holding the black ground wire to the power switch bracket.
- 3 Remove the two screws holding the assembly to the terminal.

Figure 2-4 Operator Control Assembly Removal



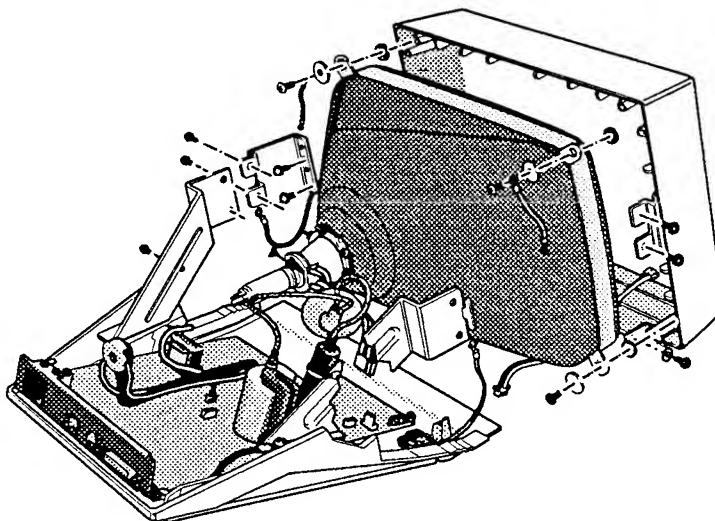
CRT Assembly

Perform the following steps to remove the CRT assembly (refer to Figure 2-5):

Warning Use extreme caution when working with or around the CRT. Even a slight fracture of the glass envelope can result in an implosion. Always hold the CRT with the neck pointing toward you.

- 1 Remove the printed circuit board and the operator control assembly.
- 2 Rest the display face of the terminal on a padded nonscratch surface.
- 3 Remove the screws holding the left and right brackets, and remove the brackets.
- 4 Remove the four screws holding the CRT assembly to the bezel.

Figure 2-5 CRT Assembly Removal



3

Module-Level Troubleshooting

INTRODUCTION

This section describes symptoms and solutions for problems you may encounter when servicing this terminal. The material is organized to help you diagnose a problem as quickly as possible.

Tools


We recommend that you have the following tools and test equipment available when servicing the terminal:

- Insulated, 12-inch, flat-blade screwdriver
- No. 1 Phillips insulated screwdriver
- No. 2 Phillips insulated screwdriver
- Test leads
- Digital multimeter
- High voltage probe
- 150 MHz oscilloscope
- DB25 loopback connector (part number 120149-01)
- RJ-11 loopback connector (part number 940720-01)

☐ **Note** See Table 3-2 and Table 3-3 at the end of this chapter for the wiring connections of the two loopback connectors.

Safety

Before beginning any procedure, familiarize yourself with the following safety warning:

 **Warning** This terminal contains lethal voltage levels. Observe all normal high-voltage equipment servicing precautions.

- Remove jewelry from your hands and wrists.
- Use only insulated or nonconductive tools.
- Turn off power except when making voltage or signal checks.
- Discharge the anode lead before disconnecting the lead from the CRT. Refer to the procedure "Discharging the Anode" in Chapter 2, "Removal and Replacement."
- Use extreme caution when working near the CRT. The tube may implode if the glass is fractured.

- Keep one hand behind you when working inside the terminal.

PRIMARY TROUBLESHOOTING PROCEDURES

Begin troubleshooting by preparing the terminal properly and running the diagnostic self-test.

Diagnostic Self-Test

The terminal diagnostic self-test starts in setup mode. If the test detects an error, an error code and message display on the screen. Error codes are defined in Table 3-1.

Table 3-1 Error Messages

Code	Failure
0	Character Ram
1	Attribute Ram
2	Font Ram
3	Extended Font Ram
P	EPROM Checksum
K	Lost Setup (Battery)
A	Port A CTS to RTS Error
C	Port A DCD to DTR Error
R	Port A DTR to DSR Error
S	Port A SPDS to SPDI Error
X	Port A I/O Loopback Error
E	Port B to PR Port DTR to DSR Error
Y	Port B to PR Port I/O Error

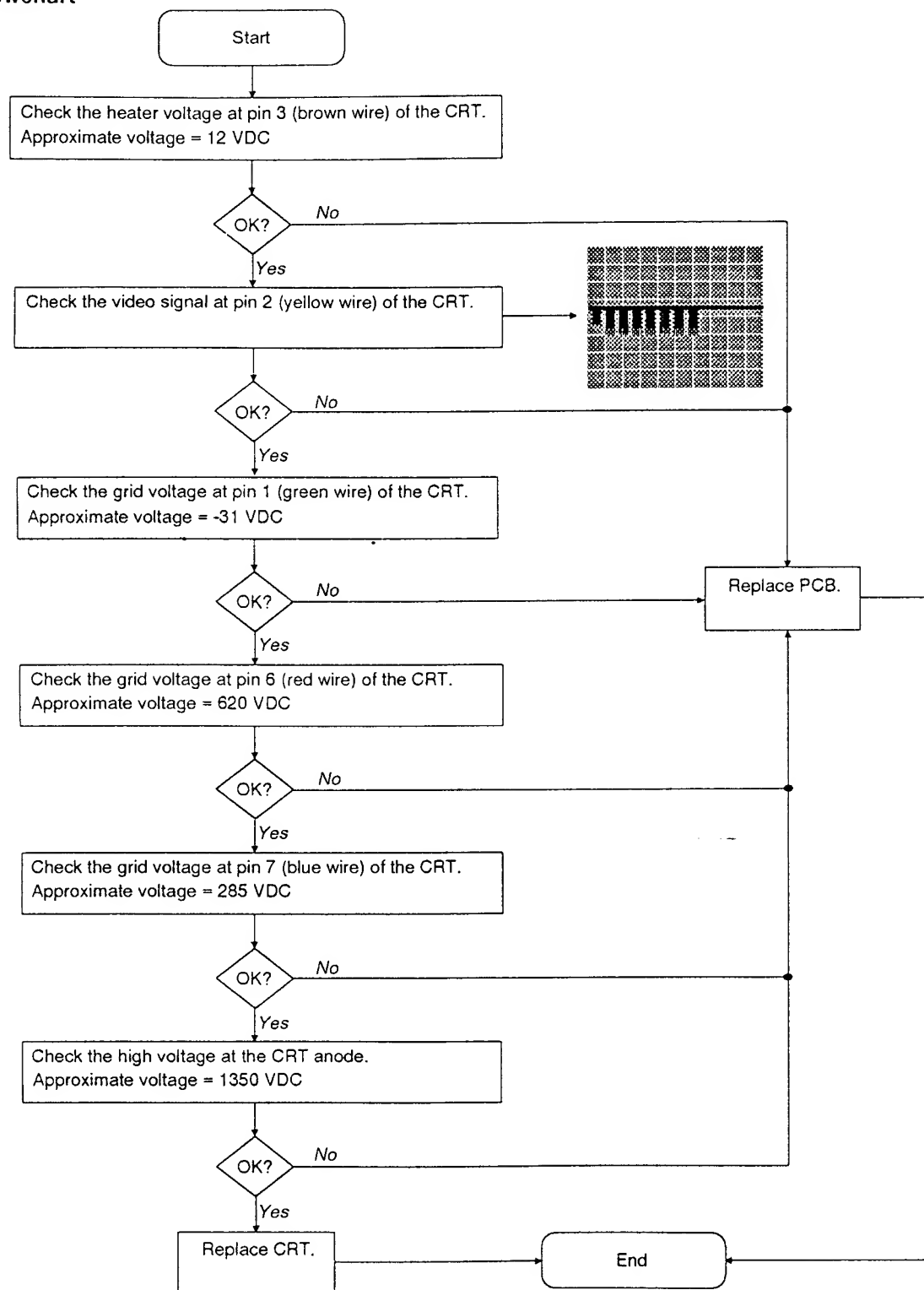
Perform the following steps to run the diagnostic self-test:

- 1 Plug the loopback connectors into the appropriate jacks.
- 2 Turn on the terminal.
- 3 If the terminal is operating correctly, it will eventually show a display of all possible characters shifting across the screen.
- 4 If the self-test program detects a problem, the terminal will display an error code on the CRT. Table 3-1 is a list of the possible errors.
- 5 If any of the error messages on Table 3-1 are displayed then replace the PCB.

☐ **Note** The first time a board is installed it may display a "K". Also, if the battery circuit is inadvertently discharged during repair, the "K" may be displayed. In this case, depress setup to clear the "K" error, then cycle the power off, then on. If the error persists replace the board.

- 6 If there is no display on the CRT, the following flowchart will help determine if the CRT or the PCB requires replacement.

Figure 3-1 Troubleshooting Flowchart



LOOPBACK CONNECTOR WIRING REFERENCE TABLES

Table 3-2 and Table 3-3 will direct you in wiring the loopback connectors correctly. These tables are intended as a guide for preparing the loopback connectors for use when running the diagnostic self-test procedure.

**Table 3-2 Loopback Connector
Wiring using RJ-11 Connector**

From Pin on Port B	To Pin on PR Port
1	6
2	5
3	4
4	3
5	2
6	1

**Table 3-3 Loopback Connector
Wiring using DB25 Connector**

From Pin	To Pin
2	3
4	5
6	8
8	20
12	23

4

Alignment and Adjustment Procedures

OVERVIEW

This chapter is divided into three sections:

- Section one provides an introduction and general setup instructions.
- Section two provides alignment and adjustment procedures.
- Section three provides a quick reference to the alignment and adjustment procedures.

Each adjustment is composed of four parts:

- Part one is the name of the adjustment.
- Part two is the test point and/or setup procedure for making the adjustment.
- Part three is the specification and tolerance for the adjustment.
- Part four is the actual adjustment.

The adjustment procedures are presented in the order in which they should be performed. If you are performing a complete terminal alignment, do not deviate from the order in which the adjustments are shown. If you are performing a subset of the complete alignment, check the tolerances of all procedures that follow the subset.

Tools

To verify or perform the adjustments for this terminal, you will need the following tools and test equipment:

- No. 1 Phillips insulated screwdriver
- Insulated 12-inch flat-blade screwdriver
- Hex-head, nonconductive, tuning (alignment) tool
- Digital multimeter
- High voltage probe
- 150 MHz oscilloscope
- Photometer
- Test leads
- DB25 loopback connector (part number 120149-01)
- RJ-11 loopback connector (part number 940720-01)

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GENERAL SETUP

Refer to Figure 4-2 for locations of test points and adjustments.

- 1 Remove the terminal housing (refer to the instructions in Chapter 2, "Removal and Replacement")
- 2 Install the loopback connectors into the appropriate jacks.
- 3 Point the neck of the CRT in a westerly direction.
- 4 Turn on the terminal. The terminal will enter into its self-test routine; twenty-five rows of text will scroll across the screen.
- 5 Allow the terminal to warm up for 30 minutes.
- 6 Enter the "M" test pattern by pressing Spacebar.

Several test patterns are called for on this procedure. Please refer to Figure 4-1 for a "road map" of how to display the requested test pattern.

Figure 4-1 Test Pattern Flowchart

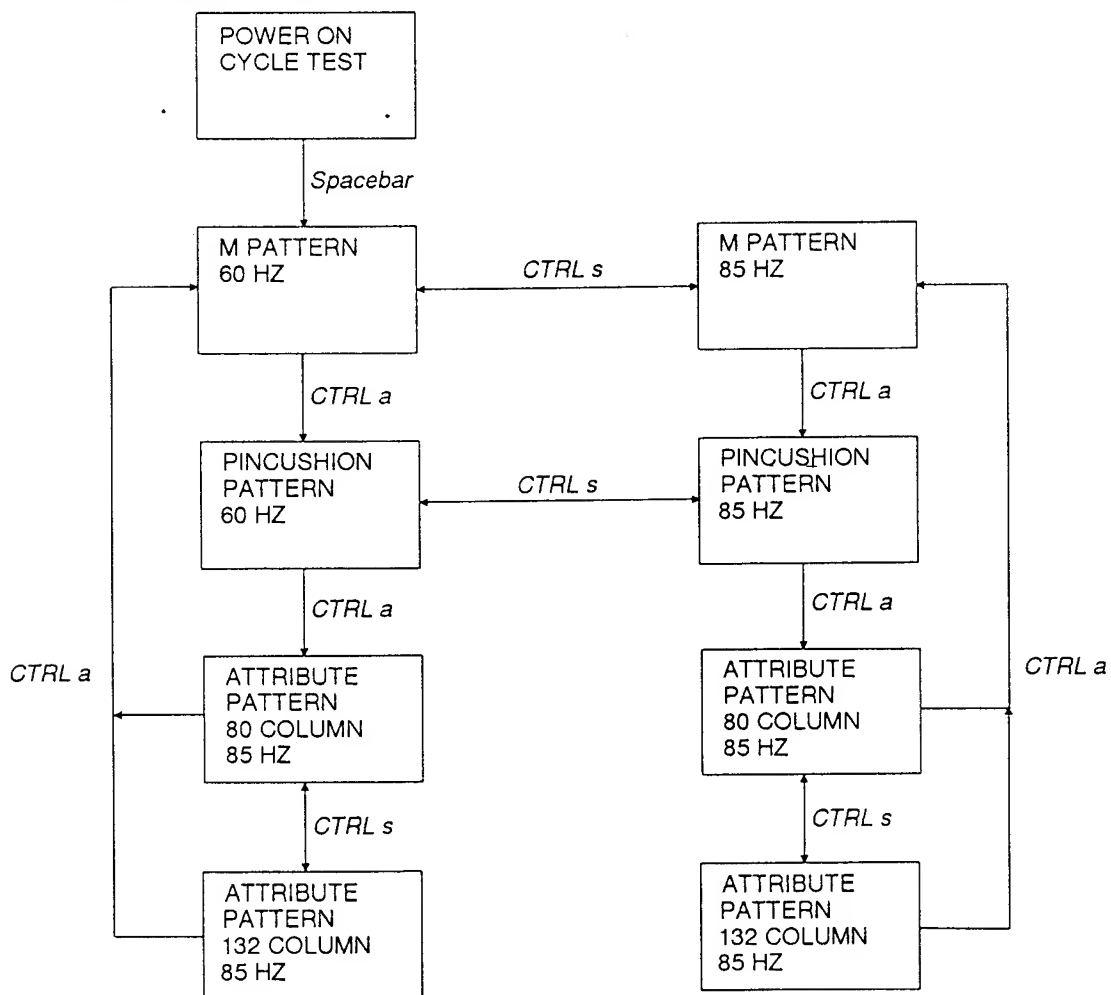
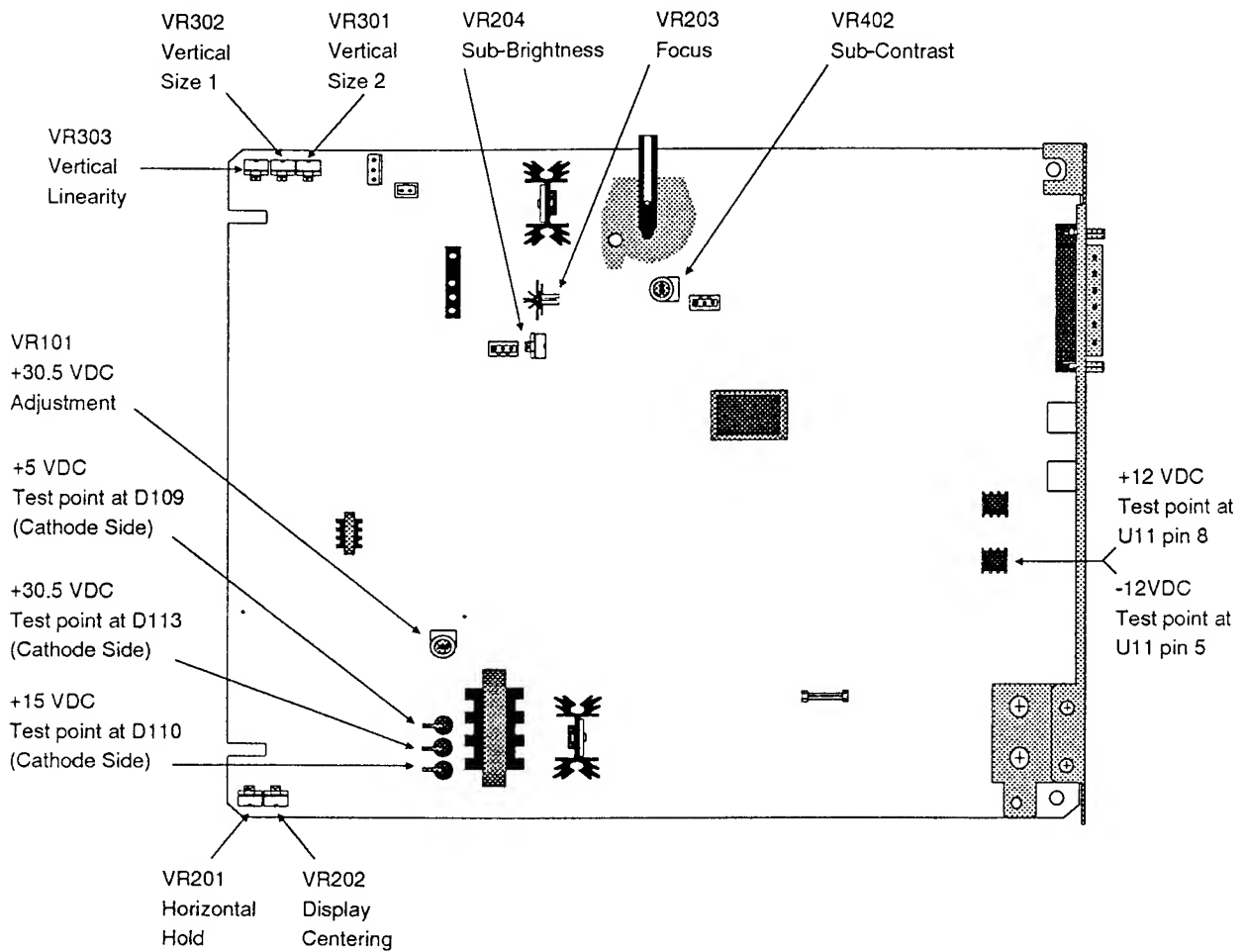


Figure 4-2 Printed Circuit Board Test and Adjustment Points



Safety

Before beginning any procedure, familiarize yourself with the following safety warnings and cautions:



Warning When the cover of the terminal is removed, you are exposed to high-voltage electrical hazards. If you need to work with the cover removed,

- Turn the power off and unplug the power cord before removing the cover.
- Use insulated or nonconductive tools.
- Keep one hand in your pocket.
- Remove jewelry from your hands and wrists.

- Use extreme caution when working with or around the CRT. Even a slight fracture of the glass envelope can result in an implosion due to the vacuum inside the tube. This can result in the electron gun in the neck of the CRT penetrating the viewing surface. Always hold the CRT with the neck pointing toward you.
- Keep one hand behind you when working inside the terminal.

■ **Caution** To help prevent damage to circuit components:

- Avoid wearing clothing made of synthetic fabrics.
- Handle circuit boards only by their edges.



Warning If you wear a grounding strap, remove it before turning on the terminal.

ALIGNMENT AND ADJUSTMENT PROCEDURES

This section describes the alignment and adjustment procedures for this terminal. Refer to Figure 4-2 for locations of test points and adjustments.



Note If you are aligning the terminal, adjust the 30.5 VDC voltage to specification. If you are checking terminal alignment, the voltage may be anywhere within the stated tolerance. If you adjust a voltage, you must check all other voltages in the alignment procedure.

Voltage Adjustment

Use the "M" test pattern to perform this adjustment.

Test point/setup—Using a digital multimeter, measure the DC voltage at the cathode of D113.

Measurement—30.5 VDC \pm 0.15 VDC.

Adjustment—Adjust VR101 until 30.5 VDC is measured at the cathode of D113.

Test point/setup—Using a digital multimeter, measure the supply voltages listed below for correct tolerance.

Voltage	Tolerance	Test Point
+15 VDC	\pm 0.8 VDC	D110
+5 VDC	\pm 0.25 VDC	D109
+12 VDC	\pm 1.5 VDC	U11 pin 8
-12 VDC	\pm 1.5 VDC	U11 pin 5

Horizontal Hold

Test point/setup—Display the pincushion test pattern

by pressing **Ctrl** **a**.

Attach the test lead between the output (terminal) side of R37 and ground.

■ **Caution** Make sure that your connection is on the output side of the resistor. Damage to the gate array may result if its output is shorted directly to ground.

Measurement—The display will "roll" in the horizontal direction only.

Adjustment—Adjust VR201 for the best possible display stabilization. The “rolling” may not stop; this is acceptable, but all vertical “roll” must be adjusted out.

Display Rotation

Test point/setup—Display the pincushion test pattern on the screen.

Measurement—The test pattern must be “square” to the bezel.

Measurement and tolerance can be verified using the following formula (refer to Figure 4-3):

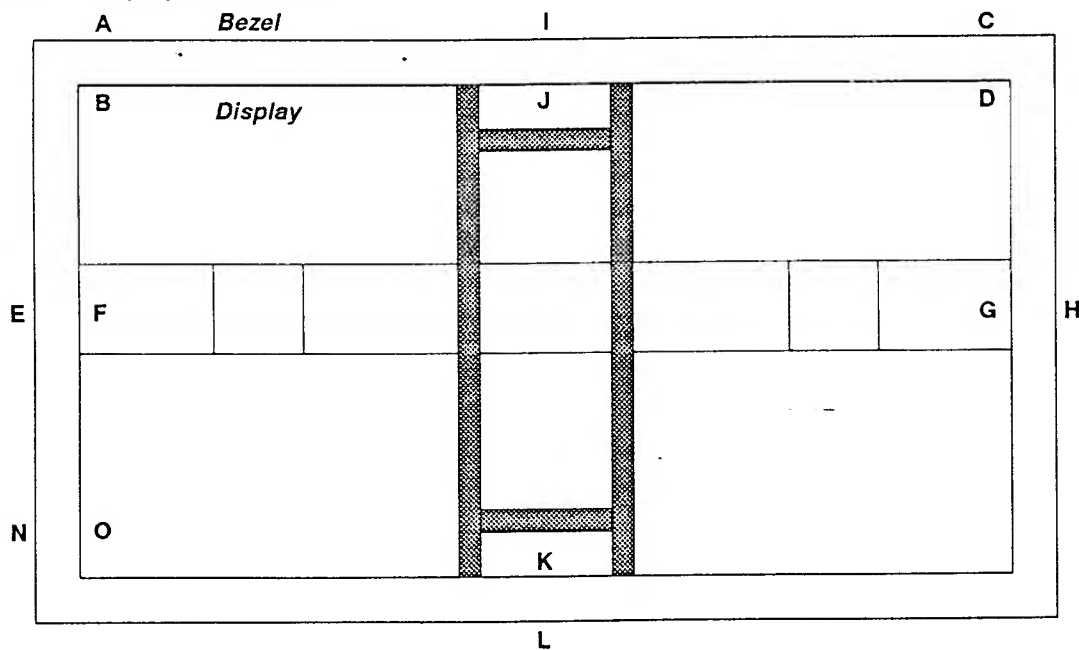
$$|AB - CD|$$

The maximum value rotation allowed is ± 1.2 mm.

Adjustment—Loosen the yoke by turning the thumbscrew. Rotate the yoke until the display is “square” to the bezel. Re-tighten the thumbscrew.

Warning You may crack or break the neck of the CRT by overtightening the yoke thumbscrew.

Figure 4-3 Display Geometries



VERTICAL CENTER
HORIZONTAL CENTER
ROTATION (TILT)
PINCUSHION

$|IJ - LK|$
 $|EF - HG|$
 $|AB - CD|$
 $|EF - NO|$

HORIZONTAL SIZE: FG
VERTICAL SIZE: JK

Vertical Center Adjustment

Test point/setup—Display the pincushion test pattern on the screen.

Measurement—The test pattern should be centered to the bezel.

Adjustment—Rotate the centering rings to center the test pattern.

Measurement and tolerance can be verified using the following formula (refer to Figure 4-3):

$$|IJ - LK|$$

The display must be centered to within ± 3 mm.

Horizontal Center Adjustment

Test point/setup—Display the pincushion test pattern on the screen.

Measurement—The test pattern should be centered to the bezel.

Adjustment—Adjust VR202 to center the test pattern on the horizontal aspect.

Measurement and tolerance can be verified using the following formula (refer to Figure 4-3):

$$|EF - HG|$$

The horizontal center adjustment tolerance is ± 3 mm.

Vertical Size, 60 Hz Mode

Test point/setup—Display the pincushion test pattern in the 60 Hz mode on the screen.

Measurement—The test pattern should be the correct vertical size (172 mm \pm 3 mm).

Adjustments—Adjust VR302 to meet the vertical size specification.

Vertical Size, 85 Hz Mode

Test point/setup—Display the pincushion test pattern in the 85 Hz mode on the screen by pressing **Ctrl** **S**.

Measurement—The test pattern should be the correct vertical size (172 mm \pm 3 mm).

Adjustments—Adjust VR301 to meet the vertical size specification.

Vertical Linearity Adjustment

Test point/setup—Display the "M" test pattern on the screen by pressing **Ctrl** **A** twice or until the pattern is displayed.

Press **Ctrl** **S** to shift to the 60 Hz mode.

Measurement—There should be proper linearity.

Adjustment—Adjust VR303 for optimum linearity.

Horizontal Size Adjustment	<p>Test point/setup—Display the pincushion test pattern on the screen.</p> <p>Measurement—The test pattern should be the correct horizontal size (237 mm \pm 3 mm).</p> <p>Adjustment—Adjust L201 to meet the horizontal size specification.</p>						
Sub-Brightness Adjustment	<p>Test point/setup—Display the “M” test pattern on the screen by pressing Ctrl S twice (or until the test pattern is displayed).</p> <p>Set the brightness and contrast controls to their minimum levels.</p> <p>Measurement—Using the photometer, measure the raster level. The raster brightness should be the correct level (1 fL \pm 0.5 fL).</p> <p>Adjustment—Adjust VR204 to meet the raster brightness specification.</p>						
Sub-Contrast Adjustment	<p>Test point/setup—Display the “M” test pattern on the screen by pressing Ctrl S twice (or until the test pattern is displayed).</p> <p>Set the brightness and contrast controls to their maximum levels.</p> <p>Measurement—Using the photometer, measure the light output of the center (brightness) box. The specifications for each of the CRT types are as follows:</p> <table data-bbox="744 940 1019 1028"> <tbody> <tr> <td>White</td><td>45 fL (+7-3)</td></tr> <tr> <td>Green</td><td>70 fL (+7-3)</td></tr> <tr> <td>Amber</td><td>32 fL (+7-3)</td></tr> </tbody> </table> <p>Adjustment—Adjust VR402 to meet the above specification.</p>	White	45 fL (+7-3)	Green	70 fL (+7-3)	Amber	32 fL (+7-3)
White	45 fL (+7-3)						
Green	70 fL (+7-3)						
Amber	32 fL (+7-3)						
Focus Adjustment	<p>Test point/setup—Display the “M” test pattern on the screen. Set the contrast control to its maximum level. Set the brightness control to 3/4 of its full counterclockwise position, (normal user level).</p> <p>Measurement—The horizontal and vertical focus lines in the test pattern should all be in focus.</p> <p>Adjustment—Adjust VR203 until the horizontal and vertical focus lines in the test pattern are sharpest and in proper focus.</p>						
Pincushion Adjustment	<p>Test point/setup—Display the pincushion test pattern on the screen. Set the brightness and contrast controls to their normal viewing levels.</p> <p>Measurement—There should be a minimum of pincushion or barrel distortion.</p> <p>Measurement and tolerance can be verified using the following formula (refer to Figure 4-3):</p> $ EF - NO $ <p>The pincushion tolerance is \pm 2.5 mm.</p>						

Adjustment—Adjust the display magnets on the yoke to minimize any pincushion or barrel distortion. The magnet locations and the areas of the display they affect are shown in Figure 4-3.

ADJUSTMENT AND ALIGNMENT QUICK REFERENCE GUIDE

This section should only be used by technicians who have experience servicing this particular terminal. Table 4-1 lists the adjustments in the order that they are to be performed. The format indicates an adjustment name and abbreviated adjustment procedure, the test pattern, and the adjustment point. If more information about the adjustment is needed, please refer to the full description in the previous section.

Table 4-1 Adjustment Quick Reference Guide

Adjustment/ Specification	Test Pattern	Adjustment Point
+30.5 VDC +30.5 VDC \pm 0.15 VDC	"M" test pattern	Cathode of D113
Horizontal Hold Best display stability	Pincushion test pattern; short output side of R37 to ground	VR201
Display Rotation Test pattern is "square" to bezel (\pm 1.2 mm)	Pincushion test pattern	Yoke
Vertical Center Test pattern is centered \pm 3 mm	Pincushion test pattern	Centering rings
Horizontal Center Test pattern is centered	Pincushion test pattern	VR202
Vertical Size (60 Hz) 172 mm \pm 3 mm	Pincushion test pattern in 60 Hz mode	VR302
Vertical Size (85 Hz) 172 mm \pm 3 mm	Pincushion test pattern in 85 Hz mode	VR301
Vertical Linearity Correct linearity	"M" test pattern	VR303
Horizontal Size 237 mm \pm 3 mm	Pincushion test pattern	L201
Sub-Brightness 1 fL \pm 0.5 fL	"M" test pattern	VR204
Sub-Contrast White 45 fL (+7-3) Green 70 fL (+7-3) Amber 32 fL (+7-3)	"M" test pattern	VR402
Focus Optimum focus	"M" test pattern	VR203
Pincushion Least pincushion distortion (2.5 mm)	Pincushion test pattern	Yoke display magnets

5

Module-Level Parts List

INTRODUCTION

Table 5-1 lists the modular level repair parts available for servicing the WY-185 Terminal.

Table 5-1 Spare Parts List

Description	Part Number
Bottom housing (Domestic & Int'l)	710339-02
Bottom housing (VDE)	710339-05
Top housing (Domestic & Int'l)	710406-07
Top housing (VDE)	710406-08
Bezel (Domestic & Int'l)	710783-01
Bezel (VDE)	710783-02
CRT green	780056-01
CRT white	780057-01
CRT amber	780058-01
WY-185 Keyboard assembly	840366-01
LED assembly	840469-01
Control bracket assembly	840844-01
AC socket assembly	840845-01
Power switch harness	940515-01
Keyboard cable	940531-01
AC harness	940566-01
MPS/Logic/CRT Driver PCBA, 110 V (Domestic)	990370-01
MPS/Logic/CRT Driver PCBA, 220 V (Int'l)	990370-02
MPS/Logic/CRT Driver PCBA 220 V (VDE)	990370-03
WY-185 Keyboard PCBA	990161-01
Complete unit — WY-185 green	900353-01
Complete unit — WY-185 white	900353-04
Complete unit — WY-185 amber	900353-07
Complete unit — WY-185 green (Int'l)	900353-02
Complete unit — WY-185 white (Int'l)	900353-05
Complete unit — WY-185 amber (Int'l)	900353-08
Complete unit — WY-185 green (VDE)	900353-03
Complete unit — WY-185 white (VDE)	900353-06
Complete unit — WY-185 amber (VDE)	900353-09



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FCC NOTICE

- ☐ **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

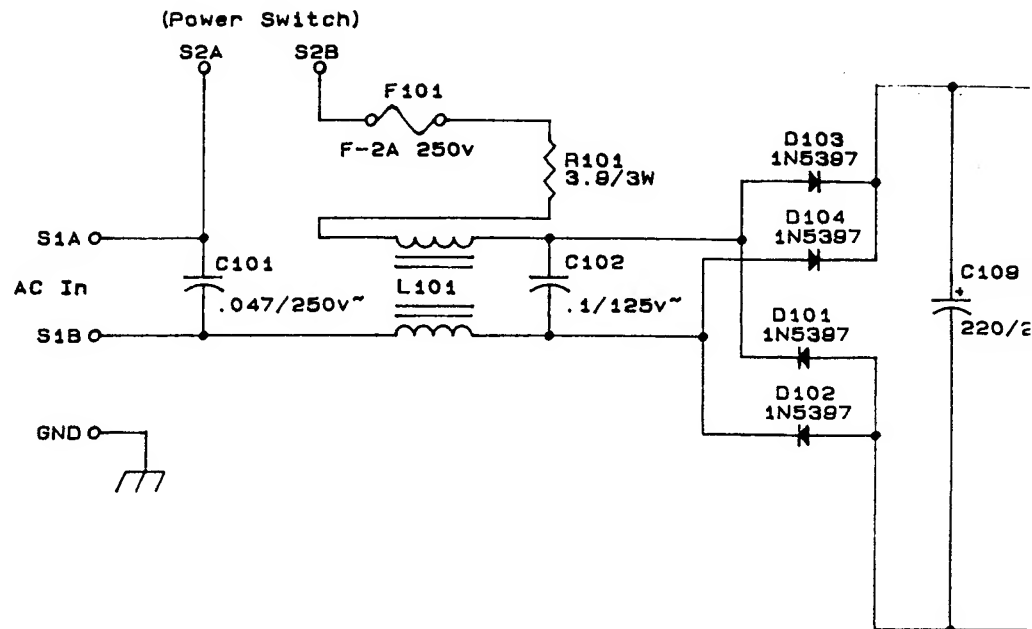
The use of shielded I/O cables is required when connecting this equipment to any and all optional peripherals or host devices. Failure to do so may violate FCC rules.

- ☐ **Caution:** Changes or modifications not covered in this manual must be approved in writing by the manufacturer's Regulatory Engineering department. Changes or modifications made without approval may void the user's authority to operate this equipment.

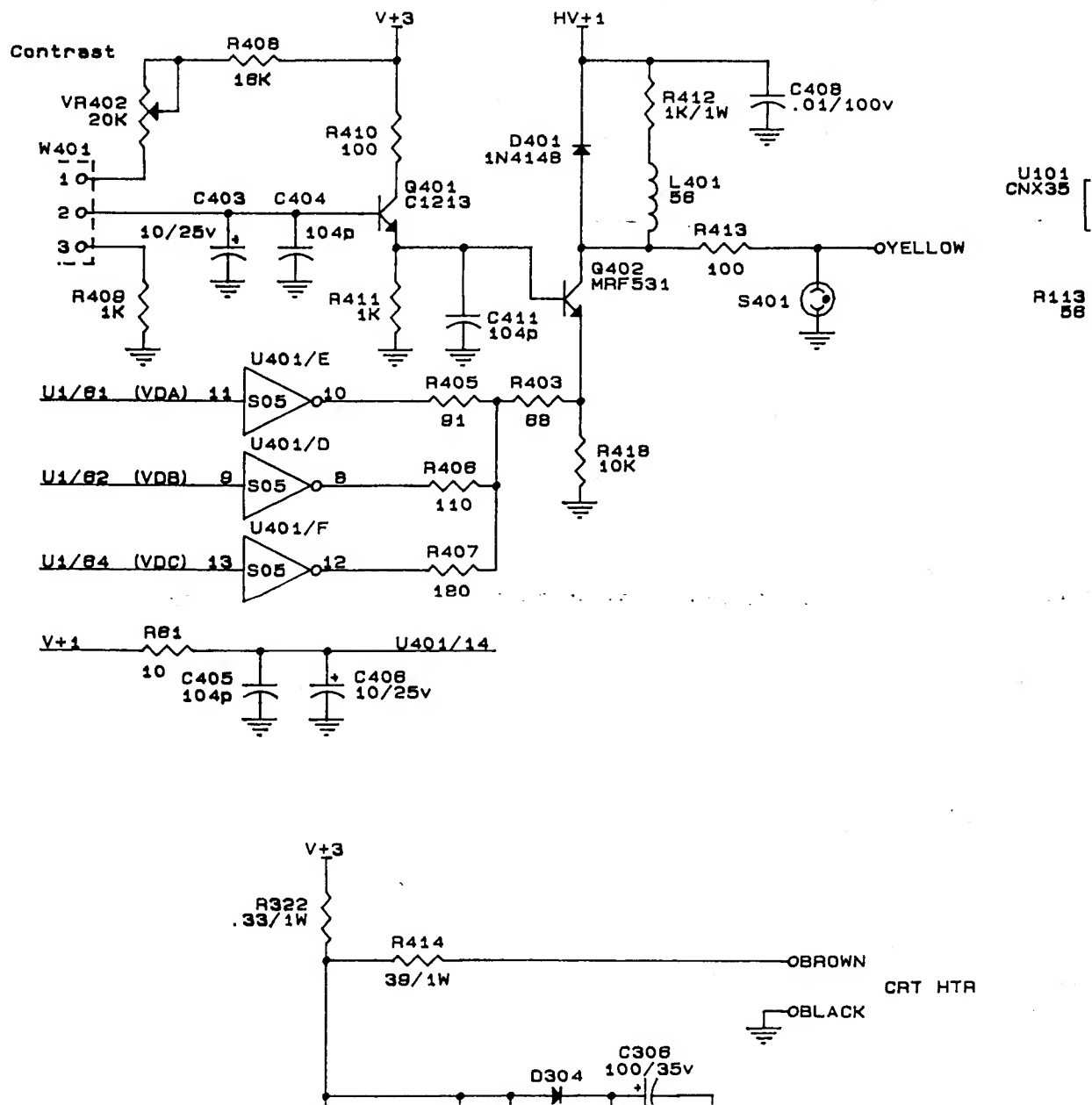
CANADIAN DOC NOTICE

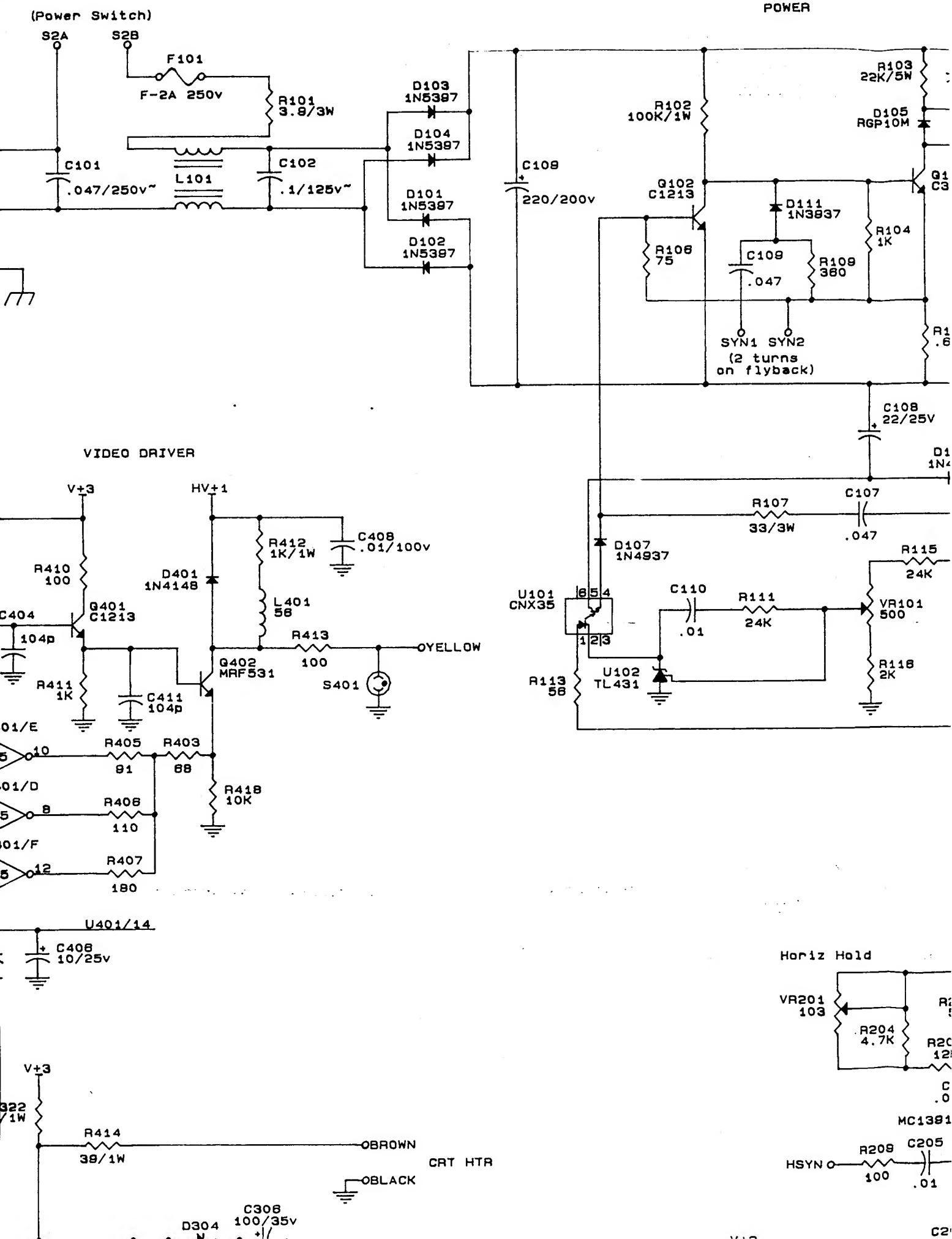
This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

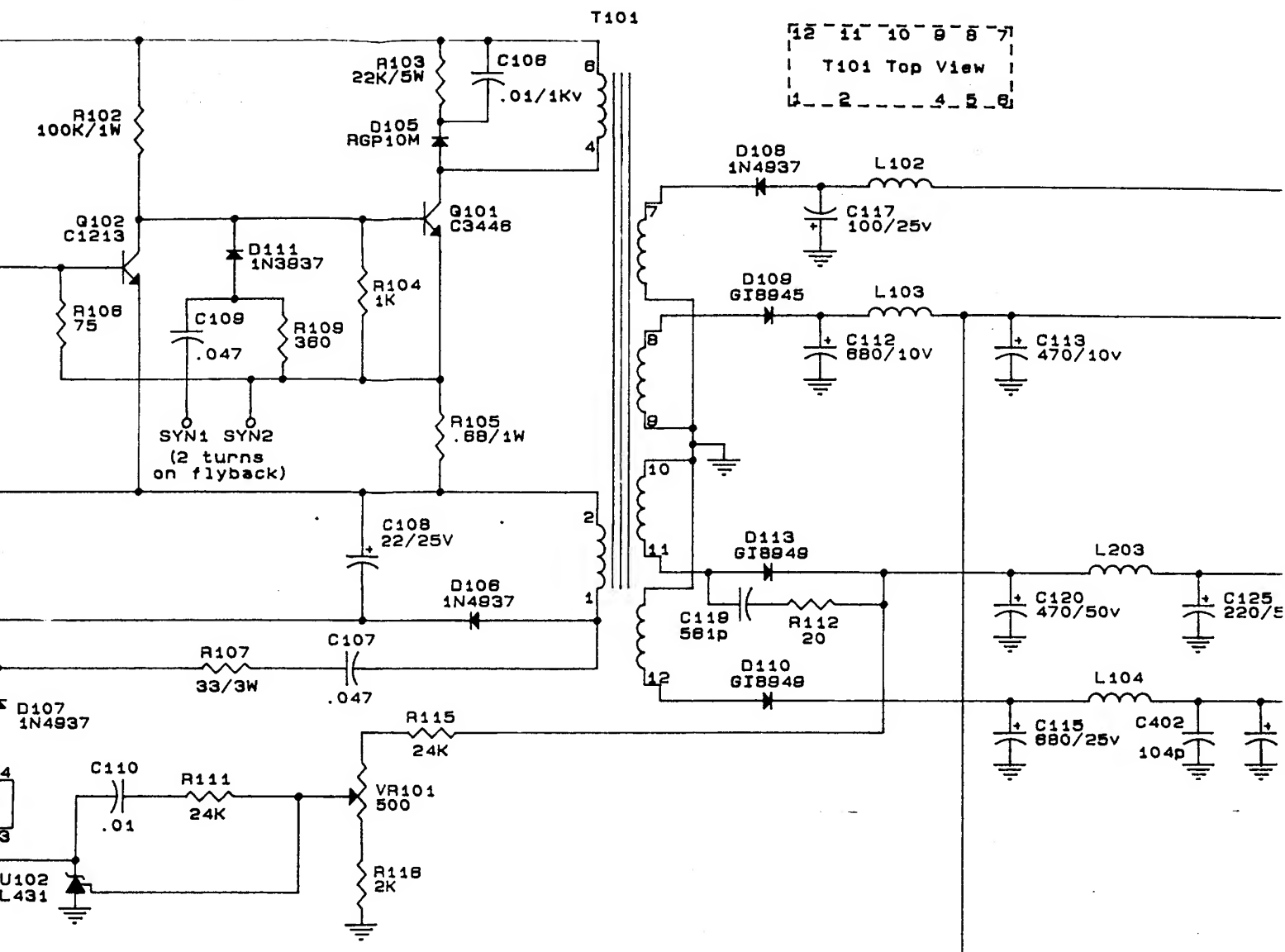


VIDEO DRIVER





POWER



HV+2

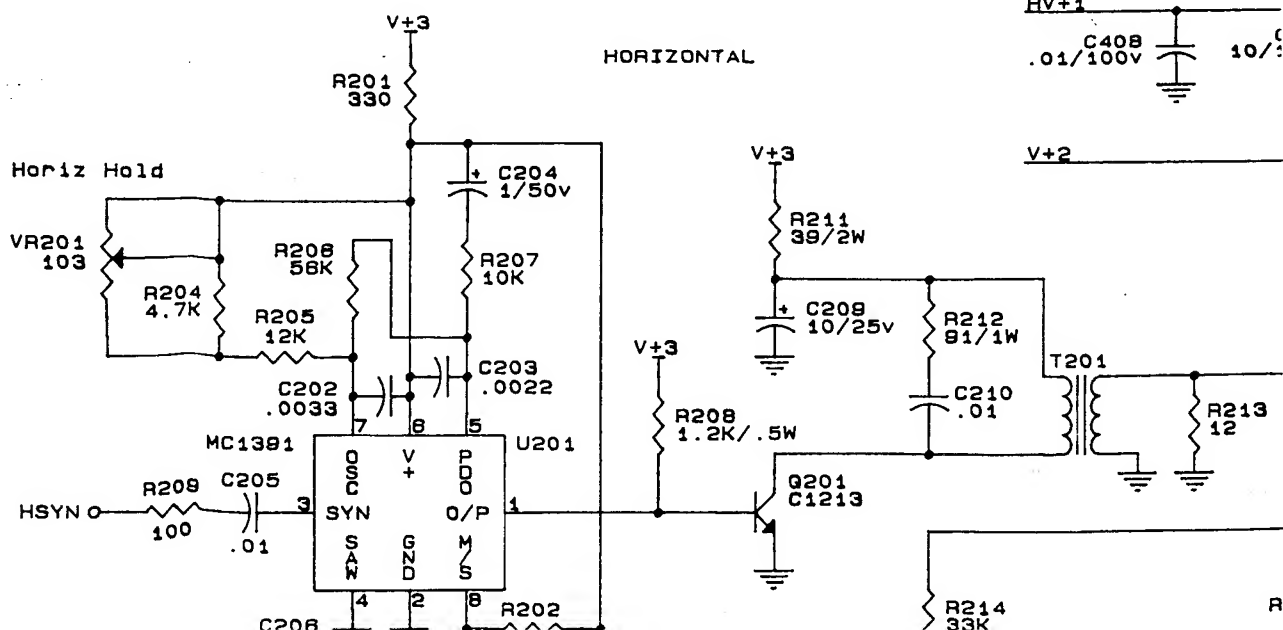
103p,

HV+1

C408 $\frac{1}{2}$ 10/3

 $v+2$

HORIZONTAL



11 10 9 8 7
T101 Top View
2 4 5 6

